National Institute of Environmental Health Sciences

Anthropogenic perturbations in marine microbial communities

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Abstract:

Human activities impact marine ecosystems at a global scale and all levels of complexity of life. Despite their importance as key players in ecosystem processes, the stress caused to microorganisms has been greatly neglected. This fact is aggravated by difficulties in the analysis of microbial communities and their high diversity, making the definition of patterns difficult. In this review, we discuss the effects of nutrient increase, pollution by organic chemicals and heavy metals and the introduction of antibiotics and pathogens into the environment. Microbial communities respond positively to nutrients and chemical pollution by increasing cell numbers. There are also significant changes in community composition, increases in diversity and high temporal variability. These changes, which evidence the modification of the environmental conditions due to anthropogenic stress, usually alter community functionality, although this aspect has not been explored in depth. Altered microbial communities in human-impacted marine environments can in turn have detrimental effects on human health (i.e. spread of pathogens and antibiotic resistance). New threats to marine ecosystems, i.e. related to climate change, could also have an impact on microbial communities. Therefore, an effort dedicated to analyse the microbial compartment in detail should be made when studying the impact of anthropogenic activities on marine ecosystems.

Source: http://dx.doi.org/10.1111/j.1574-6976.2010.00248.x

Resource Description

Exposure :

weather or climate related pathway by which climate change affects health

Ecosystem Changes, Food/Water Quality

Food/Water Quality: Biotoxin/Algal Bloom, Chemical, Pathogen

Geographic Feature:

resource focuses on specific type of geography

Ocean/Coastal

Geographic Location:

resource focuses on specific location

Global or Unspecified

Health Co-Benefit/Co–Harm (Adaption/Mitigation): ☑

specification of beneficial or harmful impacts to health resulting from efforts to reduce or cope with greenhouse gases

A focus of content

Health Impact: ☑

specification of health effect or disease related to climate change exposure

Infectious Disease

Infectious Disease: Foodborne/Waterborne Disease

Foodborne/Waterborne Disease: Cholera, General Foodborne/Waterborne Disease, Vibrioses

Mitigation/Adaptation: ☑

mitigation or adaptation strategy is a focus of resource

Mitigation

Resource Type: ☑

format or standard characteristic of resource

Review

Timescale: ☑

time period studied

Time Scale Unspecified